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Report No. SY50-92-050

Date: 12 November 1992

SUPPORT SYSTEMS DEPARTMENT TECHNICAL REPORT

Support Systems Department (SY50)
Systems Engineering Test Directorate
Naval Air Warfare Center Aircraft Division
Patuxent River, Maryland 20670-5304

Title: Developmental Assist of the ADU-567/E Wing/Fin Guard Adapter
with the ADU-514A/E Small Missile Adapter

AIRTASK No.: A5525523/0535/COMODITY5

Work Unit No.: A5523-12AR/Q

Report Sequence Under Work Unit: First Report (Final)

Dates of Tests: 5 - 23 October 1992

Location of Tests: NAVAIRWARCENACDIV Patuxent River

SY50 Project Engineer: Mr. A. Ferraro

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INTRODUCTION

BACKGROUND

1. The ADU-567/E Wing/Fin Guard Adapter is designed to attach to the ADU-514/E Small Missile Adapter. It provides protection for AIM-9 Sidewinder Missile wings and fins when the missiles are transported in the shipboard environment on a MHU-191/M Munitions Transporter configured with an ADU-514/E. The introduction of the ADU-514A/E Small Missile Adapter requires that a compatibility study between it and the ADU-567/E be conducted. The ADU-567/E was not evaluated at the same time that the ADU-514A/E was originally evaluated due to lack of assets.

2. NAVAIRWARCENACDIV Patuxent River was tasked to conduct a developmental assist to determine the physical compatibility and functional capability of the ADU-567/E Wing/Fin Guard Adapter with the ADU-514A/E Small Missile Adapter.

PURPOSE

3. The developmental assist was conducted to determine the physical compatibility and functional capability of the ADU-567/E with the ADU-514A/E Small Missile Adapter to transport the AIM-9 Sidewinder Missile in the shipboard environment.

DESCRIPTION OF EQUIPMENT

4. The ADU-567/E Wing/Fin Guard Adapter consists of a main tube weldment, tube extension, pivot tube, two guards, and retractable spring locking plungers. Upper and lower tubes fitted on each end of the main tube weldment allow the Adapter to slide on between the upper frame and lower frame of two ADU-514 Series Small Missile Adapter assemblies mounted on the MHU-191/M Munitions Transporter. The tube extension can be retracted and locked into the main tube weldment and the two guards can be pivoted and locked onto a flat position to create a compact shipping and stowage package. The ADU-567/E weighs 65 lb, is 36 in. wide, and 83 in. long in its extended position.

5. The ADU-514/E and the ADU-514A/E Small Missile Adapters are used to carry various missiles on common Navy and Marine Corps Armament Weapons Support Equipment (AWSE). Both are steel weldments with jell filled chocks intended to interface with various diameter missiles ranging from 5 to 10 in. The chocks are arranged in tiers, with the upper tiers having the capability of being rotated 90 deg to facilitate insertion/removal of the missiles stowed below them. The ADU-514/E has two tiers and the ADU-514A/E has three. On the ADU-514A/E the center tube has two sets of pinning holes for the chocks, one marked SW (Sidewinder) and the other marked STD (Standard). It also has adjustable rail interface chocks pinned at its base so that each adapter could interface the 10 in. or 15 in. rails found on Navy and Marine Corps Weapons Transporters.

6. A detailed description of the AWSE used in support of this evaluation may be found in NAVAIR 11-140-24, Description and Characteristics of Airborne Weapons Support Equipment, of 1 September 1990.

SCOPE OF TESTS

7. The ADU-567/E Wing/Fin Guard Adapter was tested with the ADU-514/E and ADU-514A/E Small Missile Adapters to determine:

- a. Physical compatibility.
- b. Functional capability.
- c. Operational safety.

METHOD OF TESTS

8. Physical compatibility was determined by:

- (a) Checking for any interference problems while configuring a MHU-191/M Munitions Transporter with two ADU-514A/E Small Missile Adapters and an ADU-567/E Wing/Fin Guard Adapter.
- (b) Placing a full complement of AIM-9 Sidewinder Missiles on a MHU-191/M Munitions Transporter configured with two ADU-514A/E Small Missile Adapters and an ADU-567/E Wing/Fin Guard Adapter and inspecting for any interference problems.

9. Functional capability was determined by using the Adapters and MHU-191/M Munitions Transporter to transport a full complement of AIM-9 Sidewinder Missiles.

10. Areas of operational safety were examined throughout the test period by observing operational usage while handling and transporting the AIM-9 Sidewinder Missiles with a MHU-191/M Munitions Transporter configured with two ADU-514A/E Small Missile Adapters and an ADU-567/E Wing/Fin Guard Adapter.

RESULTS AND DISCUSSION

GENERAL

11. The ADU-567/E was physically compatible with the ADU-514A/E Small Missile Adapter and functionally capable of protecting the wings/fins while transporting the AIM-9 Sidewinder Missiles using the MHU-191/M Munitions Transporter configured with two ADU-514A/E Small Missile Adapters.

SPECIFIC

12. The obstacle clearance requirement for door sills aboard aircraft carriers is 3 in. of rise with a 4 deg slope on each side of the sill. There was 5 in. of clearance between the bottom of the guard on the ADU-567/E and the deck with the ADU-567/E positioned between the first and second frame of the ADU-514A/E. There was 19 in. of clearance when it was positioned between the second and third frame. The 5 in. of clearance was adequate.

13. The ADU-567/E fit loosely on the ADU-514A/E, causing the aft end to dip slightly. This was not considered a problem since adequate deck clearance was still available. The loose tolerance did allow for easy placement and removal of the ADU-567/E from the ADU-514A/E.

CONCLUSIONS

GENERAL

14. The ADU-567/E Wing/Fin Guard Adapter is suitable for use with the ADU-514A/E Small Missile Adapter and the MHU-191/M Munitions Transporter to transport six AIM-9 Sidewinder Missiles in the shipboard environment.

RECOMMENDATIONS

15. Approve the use of the ADU-567/E Wing/Fin Guard Adapter for use with the ADU-514A/E Small Missile Adapter and the MHU-191/M Munitions Transporter to protect wings and fins while transporting six AIM-9 Sidewinder Missiles in the shipboard environment.

16. The ADU-567/E should be positioned either between the first and second frame on the ADU-514A/E (between the lowest two frames) or between the second and third frame (the highest two frames). The recommended primary position is the low position, however, the higher position should be authorized as an alternative position in case any unforeseen obstacles appear in the future. This will avoid change requirements to technical documentation and allow fleet personnel to utilize all the safe options available.

17. Incorporate the use of the ADU-567/E Wing/Fin Guard Adapter with the ADU-514A/E Small Missile Adapter on the MHU-191/M Munitions Transporter for transporting up to six AIM-9 Sidewinder missiles into the applicable technical documentation.

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DEPARTMENT OF THE ARMY

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REPLY TO
ATTENTION OF:

MCMR-RMI-S (70-1y)

19 Jan 01

MEMORANDUM FOR Administrator, Defense Technical Information
Center, ATTN: DTIC-OCA, 8725 John J. Kingman
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SUBJECT: Request Change in Distribution Statement

1. The U.S. Army Medical Research and Materiel Command has reexamined the need for the limitation assigned to technical reports written for Award 7BHOSMM7715. Request the limited distribution statement for Accession Document Number ADB254892 be changed to "Approved for public release; distribution unlimited." This report should be released to the National Technical Information Service.

2. Point of contact for this request is Ms. Judy Pawlus at DSN 343-7322 or by email at judy.pawlus@det.amedd.army.mil.

FOR THE COMMANDER:

A handwritten signature in dark ink, appearing to read "Phyllis M. Rinehart", is written over the typed name and title.

PHYLLIS M. RINEHART
Deputy Chief of Staff for
Information Management